

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Currently Amended) A washing method comprising:

a nonaqueous washing process of washing an object to be washed using a ~~nonaqueous~~ hydrocarbon solution;

an intermediate washing process of washing the object to be washed using alcohol after said nonaqueous washing process; and

an aqueous washing process of washing the object to be washed with the aqueous solution after said intermediate washing process.

2. (Withdrawn) A washing method as claimed in claim 1, further comprising:

a drying process of drying the object to be washed between said nonaqueous washing process and said intermediate washing process.

3. (Withdrawn) A washing method as claimed in claim 2, wherein the drying process is performed by using a vapor of the solution having solubility relative to both an aqueous solution and the nonaqueous solution.

4. (Previously Presented) The washing method as claimed in claim 1, further comprising:

a drying process of drying the object to be washed between said intermediate washing process and said aqueous washing process.

5. (Previously Presented) The washing method as claimed in claim 4, wherein the drying process is performed by using a vapor of alcohol.

6 and 7 (Cancelled)

8. (Previously Presented) The washing method as claimed in 1, wherein said alcohol used in the intermediate washing process is isopropyl alcohol.

9. (Withdrawn) A washing method as claimed in claim 6, wherein the hydrocarbon solution is ketone.

10. (Withdrawn) A washing method as claimed in claim 9, wherein the hydrocarbon solution is acetone.

11. (Previously Presented) The washing method as claimed in claim 1, wherein ultrasonic vibration is applied during the washing performed in said nonaqueous washing process.

12. (Withdrawn) A washing method as claimed in claim 1, wherein ultrasonic vibration is applied during the washing performed in said intermediate washing process.

13. (Withdrawn) A washing method as claimed in claim 1, wherein ultrasonic vibration is applied during the washing performed in said aqueous washing process.

14. (Previously Presented) The washing method as claimed in claim 1, wherein the object to be washed are optical components.

15. (Withdrawn) A washing method comprising:
a nonaqueous washing process of washing an object to be washed using a nonaqueous solution;
an intermediate washing and drying process of simultaneously washing and drying the object to be washed using a solution having solubility relative to both an aqueous solution and the nonaqueous solution after said nonaqueous washing process; and
an aqueous washing process of washing the object to be washed with the aqueous solution after said intermediate washing process.

16. (Withdrawn) A washing method as claimed in claim 15, wherein the intermediate washing and drying process is performed by using a vapor of the solution having solubility relative to both an aqueous solution and the nonaqueous solution.

17. (Withdrawn) A washing method as claimed claim 15, wherein the solution having solubility relative to both an aqueous solution and the nonaqueous solution in the intermediate washing process is a hydrocarbon solution.

18. (Withdrawn) A washing method as claimed in claim 16, wherein the object to be washed are optical components.

19. (New) A washing method comprising the steps of:

- (A) washing an object to be washed using a hydrocarbon washing agent;
- (B) washing the object using alcohol after the step (A);
- (C) washing the object using an aqueous solution including an emulsifier after the step (B); and
- (D) washing the object using a water after the step (C).

20. (New) A washing method as claimed in claim 19, wherein said alcohol used in the step (B) is isopropyl alcohol.

21. (New) A washing method as claimed in claim 19, further comprising the step of drying the object between the step (C) and the step (D).

22. (New) A washing method as claimed in claim 21, wherein the drying process is performed by using a vapor of alcohol.

23. (New) A washing method as claimed in claim 19, further comprising the step of drying the object between the step (A) and the step (B).

24. (New) A washing method as claimed in claim 23, wherein the drying process is performed by using a vapor of alcohol.

25. (New) A washing method as claimed in claim 19, wherein ultrasonic vibration is applied in at least one of the steps (A), (B), (C) and (D) while washing the object.

REMARKS/ARGUMENTS

In response to the Office Action dated June 3, 2003, claim 1 is amended, claim 6 is cancelled and claims 19-25 are added. Claims 1, 4, 5, 8, 11, 14 and 19-25 are now active in this application. No new matter has been added.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 103

Claims 1, 6, 8 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishi (USPN 5,868,864), which is an English equivalent of JP 9-208995, published 08/1997, in view of Sherman "Emulsion Science" (Handbook), Academic Press, 1968, page 150.

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishi and Sherman in view of Morita (JP 05266412).

Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nishi and Sherman in view of Osano et al. (USPN 5,334,258).

The rejection of claim 6 is respectfully traversed.

To expedite prosecution, independent claim 1 is amended to include the limitation of claim 6. Thus, amended claim 1 now recites:

A washing method comprising:
a nonaqueous washing process of washing an object to be washed using a ~~nonaqueous~~ hydrocarbon solution;
an intermediate washing process of washing the object to be washed using alcohol after said nonaqueous washing process; and
an aqueous washing process of washing the object to be washed with the aqueous solution after said intermediate washing process.

As described in "Description of the Related Art" of the present specification, the objective of the present invention is to eliminate the problems arising when an object is washed by using a hydrocarbon solution (a hydrocarbon washing agent).

The Declaration under 37 CFR 1.132 filed April 20, 2004 describes clearly the problems address by the present invention. In particular, emulsification does not occurred when a hydrocarbon solution (a hydrocarbon washing agent) is mixed with the emulsifier solution.

Nishi does not disclose or suggest the (disclosed) problems associated with a washing method of using a hydrocarbon washing agent. Nishi only disclose a washing method of using *chlorine type solvents* such as perchloroethylene and tetrachloroethylene to wash an object to be washed. Perchloroethylene and tetrachloroethylene are **NOT** hydrocarbon solutions (hydrocarbon washing agents), as recited in amended claim 1.

The features recited in the present invention are new and cannot be derived from Nishi. While perchloroethylene and tetrachloroethylene solvents may be non-aqueous solutions, they are certainly not hydrocarbon solutions. What is actually taught in Nishi is washing an object to be washed "in ethylene or a similar substance (lipophilic agent such perchloroethylene and tetrachloroethylene)"; see column 2, line 65 through column 3, line 1.

It is noted that Nishi does not suggest a hydrocarbon washing agent as one of the examples of a lipophilic agent that can be used for washing the object to be washed. Thus, a person of ordinary skill in the art would have no realistic reason to use a hydrocarbon solution in Nishi's washing step of washing an object to be washed instead of the chlorine solvents merely because they both happen to be lipophilic agents. If Nishi intended to include a hydrocarbon solution as one of the types of lipophilic agents that can be used in the dipping the object to be washed in degreasing, then an example of a hydrocarbon solution would have been disclosed as

one of the types of similar substance that can be used in dipping the object to be washed in degreasing.

Furthermore, a person of ordinary skill in the art would have no realistic motive to utilize one of alcohols of Sherman as the detergent in the method of Nishi because the objective of the present invention (suppressing rapid degradation of the aqueous solution used in an aqueous washing process that is subsequent to a washing process of washing using a hydrocarbon solution by introducing an intermediate washing process using alcohol) is not derived from Nishi, which does not disclose washing an object to be washed in a hydrocarbon solution.

Finally, it is well settled that the discovery of the source of a problem constitutes evidence of nonobviousness. **In re Sponnoble**, 405 F.2d 578, 160 USPQ 237 (CCPA 1969). It remains without dispute on this record that Applicant has discovered the source of the problem of emulsification not occurring when washing an object to be washed using an aqueous solution including an emulsifier is performed immediately after washing the object to be washed using a hydrocarbon solution (hydrocarbon washing after), and that the present invention addresses this problem by providing an intermediate step of washing the object to be washed using alcohol. Applicant's discovery of the source of the problem underscores the nonobviousness of the claimed invention as a whole. Thus, the invention recited in amended claim 1 is not obvious over Nishi and Sherman, considered alone or in combination.

As to claims 4-6, 8, 11 and 14, these claims depend from claim 1. As amended claim 1 patentable over Nishi and Sherman, dependent claims 4-6, 8, 11 and 14 are patentable over Nishi and Sherman also. Consequently, the allowance of amended independent claim 1, as well as dependent claims 4-6, 8, 11 and 14, is respectfully solicited.